DATE:

July 14, 2005

SUBJECT:

Vapor Intrusion Assessment

South Dayton Dump Site, Moraine, OH

FROM:

Arunas Draugelis, Toxicologist

RRB#2, Section #5

TO:

Karen Cibulskis, RPM

RRB#1, Section 2



I have looked over the data you provided for the potential vapor intrusion risks for homes at the South Dayton Dump Site in Moraine, OH, the soil boring logs of MW-101A and MW-210 and using the highest levels of TCE (250ug/L) and vinyl chloride (180ug/L) ran the J & E vapor intrusion model.

The calculated incremental risks are as follows:

For MW-210

Vinyl Chloride

4.3E-04

Trichloroethylene 1.7 E-03

For MW 101A

Vinyl Chloride

1.1 E-05

Trichloroethylene 7.3 E-05

I would recommend that you look into the following options to verify if the vapor intrusion pathway into the homes is a valid health risk concern:

- 1. Find out what the groundwater concentration of TCE & VC under/near the homes is right now. However, that this data to be more meaningful for the vapor intrusion pathway in the J&E model, you would also need to know the actual soil geology near the homes.
- 2. Take air samples from under the slab/basement in the homes.
- 3. Consider installing vapor venting equipment in homes to alleviate the problem right now versus more sampling, etc., as a cost savings alternative.

I noticed that MW-101A soil boring log looks like what you would normally expect to find there but MW-210 soil boring log seems to indicate that the area was excavated and then refilled. Recommend a geologist look at this and give his explanation. This could explain the difference between the two wells in the calculated incremental risk that the J&E model run shows.

When running the J&E vapor intrusion model we are assuming that the plume is near/under the homes with a soil geology similar to the soil boring log information provided. It would be very useful to know the actual soil geology under/near the homes and the data could be gathered when doing additional sampling in the home area.

**GW-ADV** CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box) Version 3.1: 02/04 YES Reset to OR Defaults CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below) YES X ENTER ENTER Initial Chemical groundwater CAS No conc. (numbers only, Cw  $(\mu q/L)$ Chemical no dashes) 75014 1.80E+02 Vinvi chloride (chloroethene) **ENTER ENTER ENTER ENTER** ENTER ENTER **ENTER** ENTER **ENTER** ENTER Totals must add up to value of Ly (cell G28) Soil Depth MORE below grade Thickness Thickness stratum A User-defined Average 0 SCS soll/ to bottom of soil Soil stratum A Depth Thickness of soil groundwater of enclosed below grade of soil stratum B. stratum C. stratum SCS soil type soil vapor temperature, space floor, to water table, stratum A, (Enter value or 0) (Enter value or 0) directly above soil type (used to estimate permeability, directly above soll vapor water table. ĸ Te عا he ho Lwi (°C) (cm²) (Enter A, B, or C) water table permeability) (cm) (cm) (cm) (cm) (cm) 10 200 450 240 210 0 В SC SIC **ENTER ENTER** ENTER **ENTER ENTER ENTER** ENTER **ENTER** ENTER **ENTER ENTER ENTER** Stratum C Stratum C MORE Stratum A Stratum A Stratum A Stratum A Stratum B Stratum B Stratum B Stratum B Stratum C Stratum C Ψ SCS soil total SCS soll dry SCS soll dry soil total soil water-filled soil dry soll water-filled soll total soil water-filled porosity, soll type bulk density, porosity, soil type bulk density, porosity, porosity, soil type bulk density, porosity. porosity,  $\rho_b^{\ C}$ пА θ.,\*  $\rho_b^B$ n<sup>8</sup> θ\_Β nC θ"C Lookup Soil P<sub>b</sub>A Lookup Soil Lookup Soil Paramoteru Paramotoru Parameters (cm<sup>3</sup>/cm<sup>3</sup>) (cm<sup>3</sup>/cm<sup>3</sup>) (g/cm<sup>3</sup>) (g/cm<sup>3</sup>) (cm<sup>3</sup>/cm<sup>3</sup>) (g/cm<sup>3</sup>) (unitless) (unitiess) (unitless) 0.216 SC 1.63 0.385 0.197 LS SIC 1.38 0.481 1.62 0.39 0.076 ENTER ENTER ENTER **ENTER ENTER** ENTER ENTER **ENTER** MORE Enclosed Enclosed Average vapor Enclosed Ψ. space Soll-bldg. space space Enclosed Floor-wall Indoor flow rate into bldg. floor pressure floor floor space seam crack air exchange OR Leave blank to calculate thickness. differential, length, width, height, width, rate. ΔΡ Lв  $W_R$ Нε w ER Q<sub>221</sub> Lyrack (cm)  $(g/cm-s^2)$ (cm) (cm) (cm) (1/h) (L/m) (cm) 10 40 1000 1000 366 0.1 0 25 5 **ENTER** ENTER ENTER MORE **ENTER ENTER** ENTER Ψ Averaging Averaging Target Target hazard time for time for Exposure Exposure risk for quotient for carcinogens, noncarcinogens, duration. frequency, carcinogens, noncarcinogens. EF TR  $AT_C$ AT<sub>NC</sub> ED THQ (yrs) (yrs) (days/yr) (unitless) (unitless) (yrs) 70 30 30 350 1.0E-06 Used to calculate risk-based END groundwater concentration

#### RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

# INCREMENTAL RISK CALCULATIONS:

Indoor exposure groundwate conc., carcinoger (µg/L)	er groundwater conc.,	Risk-based indoor exposure groundwater conc.,	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc (μg/L)	incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA NA	NA NA	NA NA	8.80E+06	NA	1.1E-05	2.9E-02

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

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#### DATA ENTRY SHEET

GW-ADV CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box) Version 3.1; 02/04 YES Reset to OR Defaults CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below) YES Х ENTER **ENTER** Initial Chemical groundwater CAS No. conc., (numbers only, C<sub>w</sub> no dashes)  $(\mu g/L)$ Chemical 79016 2.50E+02 Trichloroethylene **ENTER** ENTER ENTER **ENTER ENTER ENTER** ENTER **ENTER ENTER** ENTER Totals must add up to value of Lw (cell G28) Soil Depth MORE Average below grade Thickness Thickness stratum A User-defined SCS soil/ to bottom Depth Thickness of soil of soil Soll stratum A groundwater of enclosed below grade of soil stratum B. stratum C. stratum SCS soil type soll vapor to water table, soil type temperature, space floor, (Enter value or 0) (Enter value or 0) directly above (used to estimate stratum A, permeability,  $T_S$ directly above soil vapor Ļ Lwi he h<sub>0</sub> water table, ĸ, (°C) (cm²) (cm) (cm) (cm) (Enter A, B, or C) water table permeability) (cm) (cm) 10 200 450 240 210 0 В SC SIC **ENTER ENTER** ENTER ENTER **ENTER** ENTER **ENTER** ENTER **ENTER** ENTER **ENTER ENTER** MORE Stratum A Stratum A Stratum A Stratum A Stratum B Stratum B Stratum B Stratum B Stratum C Stratum C Stratum C Stratum C Ψ SCS SCS soil dry soil total soil water-filled SCS soil dry soil total soll water-filled soil dry soli total soil water-filled soil type bulk density, porosity, porosity, soll type bulk density, porosity, porosity, soll type bulk density, porosity, porosity,  $\rho_b^{\ A}$ θ, F nc nΑ θ,, ρPE nβ  $\rho_b^c$  $\theta^{r}_{c}$ Lookup Soll Lookup Soil Lookup Soll Рагалюютя Paramotore Paramotora (cm<sup>3</sup>/cm<sup>3</sup>) (cm<sup>3</sup>/cm<sup>3</sup>) (cm<sup>3</sup>/cm<sup>3</sup>) (g/cm<sup>3</sup>) (unitless) (g/cm<sup>3</sup>) (unitless) (g/cm<sup>3</sup>) (unitless) SIC 1.38 0.481 0.216 SC 1.63 0.385 0.197 LS 1.62 0.39 0.076 **ENTER ENTER ENTER ENTER** ENTER **ENTER ENTER ENTER** MORE Enclosed Enclosed Enclosed Average vapor Ψ Soil-bldg. Enclosed Floor-wall flow rate into bldg. space space space Indoor OR floor pressure floor floor space seam crack air exchange Leave blank to calculate thickness, differential, length, width, height, width, rate, ΔΡ  $W_{B}$ HB ER Q Lв w (L/m) (cm) (g/cm-s<sup>2</sup>) (cm) (cm) (cm) (cm) (1/h) 5 10 40 1000 1000 366 01 0.25 MORE **ENTER ENTER ENTER ENTER** ENTER **ENTER** Ψ Averaging Target hazard Averaging Target time for risk for quotient for time for -Exposure Exposure noncarcinogens, carcinogens, duration, carcinogens, noncarcinogens, frequency, ΕD EF TR THQ  $AT_{C}$ AT<sub>NC</sub> (yrs) (yrs) (unitless) (unitless) (yrs) (days/yr) 70 30 30 350 1.0E-06 Used to calculate risk-based END groundwater concentration.

#### RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

#### INCREMENTAL RISK CALCULATIONS:

Indoor exposure groundwater conc.,· carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)	incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA	NA	1.47E+06	NA NA	7.3E-05	3.9E-02

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based groundwater concentration is based on a route-to-route extrapolation.

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NA	NA	NA	8.80E+06	NA	4.3E-04	1.2E+00

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groundwater concentration.

# RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

# INCREMENTAL RISK CALCULATIONS:

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NA	NA NA	NA	1.47E+06	NA	1.7E-03	8.9E-01

MESSAGE AND ERROR SUMMARY BELOW: (DO NOT USE RESULTS IF ERRORS ARE PRESENT)

MESSAGE: Risk/HQ or risk-based groundwater concentration is based on a route-to-route extrapolation.

SCROLL. DOWN TO "END"

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